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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,892	11/19/2003	Karl W. Koch III	SP03-162	9413
22928	7590	09/29/2005	EXAMINER	
CORNING INCORPORATED			RAHLL, JERRY T	
SP-TI-3-1			ART UNIT	
CORNING, NY 14831			PAPER NUMBER	
			2874	

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/716,892

Applicant(s)

KOCH ET AL.

Examiner

Jerry T. Rahl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-21 is/are allowed.
- 6) ☒ Claim(s) 1,4,6-9 and 16 is/are rejected.
- 7) ☒ Claim(s) 2,3,5,10-15,17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/19/03; 8/15/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statements (IDS) submitted on 19 November 2003 and 15 August 2005 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### ***Drawings***

2. The drawings submitted on 19 November 2003 have been reviewed and determined to facilitate understanding of the invention. The drawings are accepted as submitted.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1, 4, 6-9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,600,597 to Beeson in view of U.S. Patent Application No. 2003/0231846 to Fajardo et al.

6. Beeson describes an apparatus having a band gap light guidance region (14), a microstructure (16) disposed adjacent to the guidance region for enhancing light guidance and a plurality of active gain material (12) disposed in an interface area between the guidance region and the microstructure, for providing active gain to the light guidance region (see Figure 1 and Columns 4-5). Beeson does not describe the light guidance region having a hollow void.

7. Fajardo et al. describes a device having a band gap guidance region with a hollow void (59, 90) and a microstructure (58, 88) disposed adjacent to the hollow void for enhancing light guidance.

8. Beeson and Fajardo et al. are analogous art form the same field of endeavor of light guiding. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the hollow void core of Fajardo et al. with the apparatus of Beeson. The motivation for doing so would have been to reduce nonlinearity (see Fajardo et al. at Paragraph [0006]).

Therefore, it would have been obvious to combine Beeson with Fajardo et al. to obtain the invention as specified in Claim 1.

9. Further, Beeson describes the microstructure having a plurality of apertures. Beeson does not specifically describe the apertures as providing a void-filling fraction in a range from 0.4 to 1.0. However, it is well-known in the art that the actual set-up of microstructures are chosen to affect certain wavelengths. Therefore, it would have been obvious to one of ordinary skill in the

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art to use apertures as providing a void-filling fraction in a range from 0.4 to 1.0 (as shown by Fajardo et al.).

10. Further, Beeson describes the microstructure comprising an active periodic two dimensional dielectric structure of a first periodicity having a plane of periodicity (perpendicular to the view of Figure 1), having an active element and configured to produce a photonic band gap and the active periodic two dimensional dielectric structure pumped by an excitation source to provide optical gain at the wavelength of the first band gap region in a direction perpendicular to the plane of periodicity (see Figure 1 and Columns 4-5).

11. Further, Beeson does not specifically describe a second periodic structure of a second periodicity. However, it is well-known in the art to use such second layers of structures to further confine guided light (as shown by Fajardo et al.). Therefore, it would have been obvious to one of ordinary skill in the art to create such a structure of a second periodicity in the device of Beeson.

12. Further, Fajardo et al. describes the hollow void creating a photonic defect state within the first band gap region (see page 3).

13. Further, Beeson describes the active element as a rare earth element (see Column 4).

14. Further, while Beeson does not specifically describe the microstructure area as about 10-300% greater than the interface area. However, Figure 1 of Beeson seems to suggest an area relationship falling within that range.

***Allowable Subject Matter***

15. Claims 19-21 are allowed.

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16. Claims 2-3, 5, 10-15 and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claims 2-3 describe the device emitting a second guided mode at a second frequency of a second range of frequencies.

18. Claim 5 describes the ratio of the numerical value of the defect to the pitch selected as to interact with the excitation of surface modes within the photonic band gap.

19. Claims 10 and 17-18 describe the defect state as supporting at least one surface mode.

20. Claim 11 describes the microstructure comprising a Bragg photonic band gap fiber.

21. Claims 12-15 and 19-21 describe the second periodic structure having a second void-filling fraction.

22. This is subject matter not described by the prior art in conjunction with the further limitations of the present claims.

### ***Conclusion***

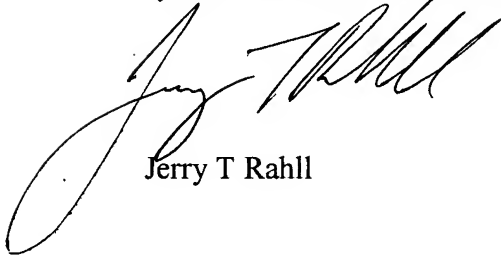
23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Application No 2004/0175085 describes a light guidance region with a hollow surrounded by a microstructure.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry T. Rahlh whose telephone number is (571) 272-2356. The examiner can normally be reached on M-Th (8:30-5:30).

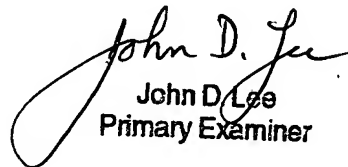
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25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jerry T Rahll



John D. Lee  
Primary Examiner